

B. Remarks

The claims are 1-26, with claims 1, 6 and 15 being independent. Claims 3, 4, 11-13 and 15-26 have been withdrawn from consideration. Reconsideration of the claims is expressly requested.

Claims 1, 2, 5-8 and 14 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over JP 6-208076 (Sakamoto). The Examiner has alleged that U.S. Patent No. 4,482,209 (Grewal) and JP 2-109003 (Ota) teach that an intermediate layer can contain chromium or titanium type materials, which help to increase the durability of the mirror. Therefore, it is the Examiner's position that it would have been obvious to substitute titanium oxide for a chromium material, which the Examiner deemed to be equivalent alternatives. The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicants again would like to briefly review some of the key features and advantages of the presently claimed invention. The present invention, in part, is directed to a metallic mirror comprising aluminum or an aluminum alloy substrate with an intermediate TiO₂ layer and a metallic reflective Cu layer formed on the intermediate layer. The presence of the TiO₂ intermediate layer overcomes problems encountered by the prior art, such as corrosion and film lifting.

When a mirror is formed on an aluminum or an aluminum alloy substrate, the composition of the intermediate layer is very important in the determination of the reflective and durability properties of the mirror. In particular, certain defects, such as corrosion and film lifting can occur.

Applicants have determined that if the intermediate layer contains titanium oxide, the above-mentioned defects are reduced and the necessary reflective characteristics of the mirror are maintained. However, when the intermediate layer is chromium or titanium, for example, the durability of the mirror is significantly reduced and the number of defects is substantially increased.

Tables 10 and 11 in the subject application illustrate in detail the superiority of the titanium oxide intermediate layer when combined with an aluminum or an aluminum alloy substrate and a copper reflective layer. In particular, when the intermediate layer is formed from TiO_2 , the observed corrosion rate is just 3%.¹ However, when the intermediate layer is formed from chromium or titanium, the observed corrosion rate is, respectively, 65.8% or 50.0%. Further, the rate of film lifting for a mirror with a titanium oxide intermediate layer is 0.0%, while this rate for a mirror containing a chromium or a titanium intermediate layer is, respectively, 23.7% or 35.0%.

Sakamoto discloses a mirror that has a Cr intermediate layer. The Examiner has alleged that it would have been obvious to replace the chromium intermediate layer with TiO_2 based in the disclosure in Grewal, which teaches titanium and chromium adhesive layers. However, as discussed above, titanium and chromium layers disclosed in Grewal are, clearly, substantially inferior to the presently claimed titanium oxide layer. Applicants respectfully submit that Grewal fails to disclose or suggest a titanium oxide intermediate layer, which is a key feature of the present invention. Furthermore, even if Grewal disclosed a titanium oxide adhesive layer, the unexpectedly superior results of the

¹/The rate is based on the ratio of the number of occurrences of the defects versus the number of the examinations performed, as explained in the specification.

present invention shown in the Comparative Test and Tables 10 and 11 rebut any possible presumption of prima facie obviousness based on the combination of Grewal and Sakamoto.

Ota, an English language translation of which is enclosed for the Examiner's convenience, is directed to the improvement of adhesion in a reflective mirror by varying the thickness of the intermediate layer. Ota discloses a number of substrates and intermediate layers, which can possibly be used in a mirror. However, Applicants respectfully submit that Ota fails to disclose or suggest combining an aluminum or an aluminum alloy substrate with a titanium oxide intermediate layer and a copper reflective layer.

The disclosure of the titanium oxide intermediate layer in Ota is insufficient for this reference to either effect the patentability of the present invention by itself or in combination with Sakamoto. As a matter of law, in order for a reference to anticipate a claim, its disclosure must clearly and unequivocally 'direct[] those skilled in the art' to make the selection Applicants have made. In re Arkley, 172 U.S.P.Q. (BNA) 524, 526 (C.C.P.A. 1972). With respect to obviousness, "a reference must be considered not only for what it expressly teaches, but for what it fairly suggests." In re Baird, 29 U.S.P.Q.2d (BNA) 1550, 1552 (Fed. Cir. 1994); In re Bruckel, 201 U.S.P.Q. (BNA) 67, 70 (C.C.P.A. 1979). Thus, to render the claims obvious, a reference must teach or fairly suggest what Applicants have done. It is respectfully submitted that Ota meets none of these requirements.

In In re Baird, the Federal Circuit reversed the decision of obviousness by the Board of Patent Appeals and Interferences stating that in view of a large generic

disclosure and the fact that the compounds that the prior art reference identified as “typical”, “preferred” and “optimum” were different from the claimed compounds, the prior art reference could not be considered to teach or fairly suggest the claimed compounds. See id. Applicants respectfully submit that a similar scenario has occurred in the present case.

Ota, at most, provides a laundry list of substrates (bases), intermediate layers and reflective layers without disclosing or suggesting the claimed combination. Specifically, Ota states that a base can consist of an inorganic material such as glass, ceramic or metal, or an organic high polymer material such as polystyrene, polymethylmethacrylate, polycarbonate or a copolymer of acrylonitrile and styrene. The intermediate layers specifically disclosed by Ota include chromium oxide, titanium oxide, tungsten oxide, tin oxide, indium oxide, aluminum oxide, chromium nitride, titanium nitride and tungsten nitride. Also, Ota discloses a number of possible reflective layers, which can be formed on the above-mentioned intermediate layers, including a nitride of aluminum, gold, silver, copper or titanium.

The generic disclosure in Ota leads to numerous combinations the vast majority of which are outside the scope of the present invention. Ota never discloses or even suggests a combination of an aluminum, an aluminum alloy or even a metal substrate with a titanium oxide intermediate layer and a copper reflecting layer. In fact, a titanium oxide layer is not disclosed in combination with any substrate or reflective layer.

In addition, as can be clearly seen on page 5 of the enclosed translation, the most preferred oxide intermediate layers in Ota are chromium oxide and tin oxide, which are not the layers presently recited in the claims. Also, Ota does not present a single

combination in which the base is a metal, much less an aluminum or an aluminum alloy as presently claimed. In the working examples, the bases used are made from a polycarbonate and polymethyl methacrylate. These materials are substantially different from the presently claimed substrate, exhibiting different properties and involving different problems that need to be solved. Furthermore, the intermediate and reflective layers in the working examples are different than those in the presently claimed invention.

At most, Ota provides an invitation to try different combinations, which is not sufficient to affect the patentability of the presently claimed invention. Furthermore, as a matter of law, in view of the large generic disclosure and the preference teaching away from the presently claimed invention, Ota does not teach or fairly suggest the presently claimed invention.

As mentioned above, Ota cannot be used to support that Examiner's assertion that it would have been obvious to replace the Cr intermediate layer in Sakamoto with a titanium oxide layer. Applicant submit that not all intermediate layers disclosed in Ota can be used successfully with all the bases and reflective layers disclosed in Ota. Since Ota does not disclose or suggest that a titanium oxide layer can be successfully used with an aluminum or an aluminum oxide substrate, replacing chromium with titanium oxide in Sakamoto based on the disclosure in Ota involves impermissible hindsight reasoning based on Applicants' disclosure.

Furthermore, the unexpectedly superior results of using a titanium oxide intermediate layer demonstrated by the Comparative Test and Tables 10 and 11 in the present application rebut any possible presumption of prima facie obviousness. In fact, the preferred chromium oxide layer in Ota is shown in the subject specification to be inferior to

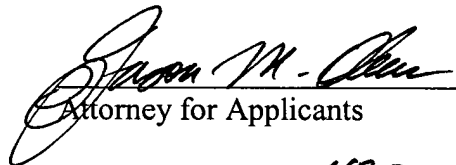
the presently claimed titanium oxide layer. Depending on the type of deposition, using the chromium oxide layer leads to either inferior durability or insufficient reflective characteristics (see substitute specification, Tables 10 and 11 and paragraph [0074]).

Accordingly, it is clear that the presently claimed invention is patentable over Sakamoto, Grewal and Ota, whether viewed alone or in any combination. Wherefore, Applicants respectfully request that the outstanding rejection be withdrawn and that the present case be passed to issue.

This Response should be considered and entered because it places the case in allowable form. Alternatively, it places this case in better form for a possible appeal.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

Respectfully submitted,


Attorney for Applicants

Registration No. 48,512

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

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